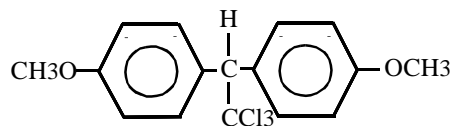


METHOXYCHLOR

Methoxychlor is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 72-43-5

Molecular Formula: $C_{16}H_{15}Cl_3O_2$



Methoxychlor occurs as white, dimorphic crystals. It is moderately soluble in alcohol and petroleum oils; readily soluble in most aromatic solvents; and insoluble in water (HSDB, 1991; Merck, 1989).

Physical Properties of Methoxychlor

Synonyms: 1,1'-(2,2,2-trichloroethylidene)-bis[4-methoxybenzene]; DMDT; methoxy-DDT; 1,1,1-trichloro-2,2-bis(p-methoxyphenyl)ethane; Marlate 2,2-di-p-anisyl-1,1,1-trichloroethane

Molecular Weight:	345.65
Melting Point:	89 °C
Density/Specific Gravity:	1.41 at 25/4 ° C (water = 1)
Vapor Pressure:	1.43×10^{-6} mm Hg at 25 °C
Log Octanol/Water Partition Coefficient:	3.05 - 4.30
Water Solubility:	0.045 mg/L at 25 °C
Conversion Factor:	1 ppm = 14.2 mg/m ³

(Howard, 1990; HSDB, 1991; Merck, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

Methoxychlor is registered as an insecticide. It is used for fly control on horses and in and around barns and stalls. It is also registered for the control of aphids, beetles, moths, and flies on fruit trees and on grapes and strawberries. The licensing and regulation of pesticides for sale and use in California are the responsibility of the Department of Pesticide Regulation (DPR). Information presented in this fact sheet regarding the permitted pesticidal uses of methoxychlor has been collected from pesticide labels registered for use in California and from DPR's pesticide databases. This information reflects pesticide use and permitted uses in California as of

October 15, 1996. For further information regarding the pesticidal uses of this compound, please contact the Pesticide Registration Branch of DPR (DPR, 1996).

B. Emissions

No emissions of methoxychlor from stationary sources in California were reported, based on data obtained from the Air Toxics “Hot Spots” Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of methoxychlor was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of methoxychlor. However, the United States Environmental Protection Agency (U.S. EPA) compiled ambient air data for methoxychlor at various locations throughout the United States from 1987-88. The mean ambient air concentration of methoxychlor was 0.1 nanograms per cubic meter (ng/m³) (U.S. EPA, 1993a).

INDOOR SOURCES AND CONCENTRATIONS

In the Nonoccupational Pesticide Exposure Study conducted by the U.S. EPA and published in 1990, levels of 32 pesticides were measured in 24-hour samples obtained inside and outside homes located in 2 cities. Approximately 70 homes in Jacksonville, Florida were monitored in each of 3 seasons, and approximately 50 homes in Springfield/Chicopee, Massachusetts were monitored in each of 2 seasons. Average (arithmetic) indoor concentrations of methoxychlor ranged from 0.2 to 0.3 ng/m³ in Jacksonville. Average indoor concentrations were below the detection limits in Springfield/Chicopee. For Jacksonville, methoxychlor was more prevalent in indoor air than in outdoor air, and average indoor methoxychlor concentrations were higher than corresponding outdoor concentrations (Immerman and Schaum, 1990).

ATMOSPHERIC PERSISTENCE

Based on the vapor pressure, methoxychlor will partition between the gas and particle phases in the atmosphere. Particle-associated methoxychlor will be subject to wet and dry deposition (of the particles). The average half-life and lifetime for particles in the atmosphere is estimated to be about 3.5 to 10 days and 5 to 15 days, respectively (Atkinson, 1995; Balkanski et al., 1993). The dominant atmospheric loss process for gaseous methoxychlor will be by reaction with the hydroxyl radical. No information is, however, available concerning the rate constant for this reaction (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Methoxychlor emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to methoxychlor are inhalation, ingestion, and dermal contact (HSDB, 1991).

Non-Cancer: Information on the acute and chronic effects of methoxychlor in humans is not available. However, chemically related organochlorine pesticides caused liver and kidney damage in humans. Methoxychlor is a central nervous system convulsant. In animals, acute exposure to methoxychlor has resulted in progressive weakness, trembling, convulsions, diarrhea, and death (U.S. EPA, 1994a).

The U.S. EPA has not established a Reference Concentration (RfC) for methoxychlor, but has set an oral Reference Dose (RfD) at 0.005 milligrams per kilogram per day based on excessive loss of litters in rabbits. The U.S. EPA estimates that consumption of this dose or less, over a lifetime, would not likely result in the occurrence of chronic non-cancer effects (U.S. EPA, 1994a).

According to the U.S. EPA, there is no information available regarding adverse effects on reproductive functions in humans. Long-term oral exposure of rats has been reported to reduce maternal fertility and increase fetotoxicity, as well as to reduce fertility in the offspring. Skeletal effects have been observed in offspring of rats exposed via gavage (U.S. EPA, 1994a).

Cancer: No studies are available on the human carcinogenicity of methoxychlor. The data from animal studies indicates mixed results. The U.S. EPA has classified methoxychlor in Group D: Not classifiable as to human carcinogenicity, based on human data being unavailable and inconclusive animal evidence (U.S. EPA, 1994a). The International Agency for Research on Cancer has classified methoxychlor in Group 3: Not classifiable for human carcinogenicity, based on no adequate data in humans and insufficient evidence in animals (IARC, 1987a).

